WHAT IS CLAIMED IS:

1. A face image recognition apparatus comprising:

a memory in which a reference feature amount of a face of a to-be-recognized person is previously registered,

an image input section which inputs a face image of a person,

a feature amount extracting section which extracts a feature amount of a face based on the face image input by said image input section,

a recognition section which determines a recognition rate between the feature amount extracted by said feature amount extracting section and the reference feature amount registered in said memory, and

a feature amount adding section which additionally registers the feature amount extracted by said feature amount extracting section as a new reference feature amount into said memory when the recognition rate determined by said recognition section is lower than a preset value.

2. The face image recognition apparatus according to claim 1, wherein said recognition section calculates similarity between the feature amount extracted by said feature amount extracting section and the reference feature amount registered in said memory and recognizes the face image input by said image input section based on the calculated similarity, and said feature amount

adding section determines that the recognition rate of said recognition section is lower than a preset value when the similarity calculated by said recognition section is smaller than a preset determining reference value.

3. The face image recognition apparatus according to claim 1, which further comprises a camera used to photograph a face image of a person and an illumination device used to apply light toward a face of a to-be-photographed person to be photographed by said camera and in which said image input section inputs the face image photographed by said camera.

4. The face image recognition apparatus according to claim 3, wherein said illumination device includes a first illuminating section which is disposed in an upper right position or upper left position of said camera in an oblique direction as viewed from the to-be-photographed person to apply light toward the face of the to-be-photographed person and a second illuminating section which is disposed below said camera to apply light toward the face of the to-be-photographed person.

5. A face image recognition apparatus comprising:

a memory in which a reference feature amount of a face of a to-be-recognized person is previously registered and a new reference feature amount can be additionally registered,

an image input section which inputs a face image of a person,

a feature amount extracting section which extracts a feature amount of a face based on the face image input by said image input section,

a recognition section which performs a first determining process for determining a recognition rate between the feature amount extracted by said feature amount extracting section and the reference feature amount previously registered in said memory when a new reference feature amount is not additionally registered in said memory, performs a second determining process for determining a recognition rate between the feature amount extracted by said feature amount extracting section and a new reference feature amount additionally registered in said memory when the new reference feature amount is additionally registered in said memory, and performs a third determining process for determining the recognition rate between the feature amount extracted by said feature amount extracting section and the reference feature amount previously registered in said memory when the recognition rate determined by the second determining process is lower than a preset value, and

a feature amount adding section which performs a first additional registration process for additionally registering the feature amount extracted by said

feature amount extracting section as a new reference feature amount into said memory when the recognition rate determined by the first determining process of said recognition section is lower than a preset value and performs a second additional registration process for deleting the new reference feature amount which is already additionally registered in said memory and additionally registering the feature amount extracted by said feature amount extracting section as a new reference feature amount into said memory when the recognition rate determined by the second determining process of said recognition section is lower than a preset value and the recognition rate determined by the third determining process of said recognition section is lower than a preset value.

6. A passage control apparatus which recognizes a face image of a passer and controls the passage of the passer, comprising:

a memory in which a reference feature amount of a face of a person who is permitted to pass through is previously registered,

an image input section which inputs a face image of a passer,

a feature amount extracting section which extracts a feature amount of a face based on the face image of the passer input by said image input section,

a recognition section which determines a

recognition rate between the feature amount extracted by said feature amount extracting section and the reference feature amount registered in said memory,

a passage control section which controls the passage of the passer based on the recognition rate determined by said recognition section, and

a feature amount adding section which additionally registers the feature amount extracted by said feature amount extracting section as a new reference feature amount into said memory when the recognition rate determined by said recognition section is lower than a preset value.

7. The passage control apparatus according to claim 6, wherein said recognition section calculates similarity between the feature amount extracted by said feature amount extracting section and the reference feature amount registered in said memory and recognizes the face image of the passer input by said image input section based on the calculated similarity, and said feature amount adding section determines that the recognition rate of said recognition section is lower than a preset value when the similarity calculated by said recognition section is smaller than a preset addition determining reference value.

8. The passage control apparatus according to claim 6, which further comprises a camera used to photograph a face image of a person and an illumination

device used to apply light toward a face of a to-be-photographed person to be photographed by said camera and in which said image input section inputs the face image photographed by said camera.

9. The passage control apparatus according to claim 8, wherein said illumination device includes a first illuminating section which is disposed in an upper right position or upper left position of said camera in an oblique direction as viewed from the to-be-photographed person to apply light toward the face of the to-be-photographed person and a second illuminating section which is disposed below said camera to apply light toward the face of the to-be-photographed person.

10. A passage control apparatus which recognizes a face image of a passer and controls the passage of the passer, comprising:

a memory in which a reference feature amount of a face of a person who is permitted to pass through is previously registered and a new reference feature amount of the face of the person who is permitted to pass through can be additionally registered,

an image input section which inputs a face image of a person,

a feature amount extracting section which extracts a feature amount of a face based on the face image of the passer input by said image input section,

a recognition section which performs a first determining process for determining a recognition rate between the feature amount extracted by said feature amount extracting section and the reference feature amount previously registered in said memory when a new reference feature amount is not additionally registered in said memory, performs a second determining process for determining a recognition rate between the feature amount extracted by said feature amount extracting section and a new reference feature amount additionally registered in said memory when the new reference feature amount is additionally registered in said memory, and performs a third determining process for determining the recognition rate between the feature amount extracted by said feature amount extracting section and the reference feature amount previously registered in said memory when the recognition rate determined by the second determining process is lower than a preset value, and

a feature amount adding section which performs a first additional registration process for additionally registering the feature amount extracted by said feature amount extracting section as a new reference feature amount into said memory when the recognition rate determined by the first determining process of said recognition section is lower than a preset value and performs a second additional registration process

for deleting the new reference feature amount which is already additionally registered in said memory and additionally registering the feature amount extracted by said feature amount extracting section as a new reference feature amount into said memory when the recognition rate determined by the second determining process of said recognition section is lower than a preset value and the recognition rate determined by the third determining process of said recognition section is lower than a preset value.

11. A face image recognition method used in a face image recognition apparatus including a memory in which a reference feature amount of a face of a to-be-recognized person is previously registered, comprising:

inputting a face image of a person,

extracting a feature amount of a face based on the input face image,

determining a recognition rate between the extracted feature amount and the reference feature amount registered in the memory, and

additionally registering the feature amount extracted from the input face image as a new reference feature amount into the memory when the determined recognition rate is lower than a preset value).

12. The face image recognition method according to claim 11, wherein said step of determining the recognition rate is to calculate similarity between the

feature amount extracted from the input face image and the reference feature amount registered in the memory and recognize the input face image based on the calculated similarity, and said step of additionally registering the feature amount into the memory is to determine that the recognition rate is lower than a preset value when the similarity is smaller than a preset addition determining reference value.

13. A face image recognition method used in a face image recognition apparatus including a memory in which a reference feature amount of a face of a to-be-recognized person is previously registered and a new reference feature amount can be additionally registered, comprising:

inputting a face image of a person,

extracting a feature amount of a face based on the input face image,

determining a recognition rate between the feature amount extracted by the feature amount extracting section and the reference feature amount previously registered in the memory when a new reference feature amount is not additionally registered in the memory,

additionally registering the feature amount extracted from the input face image as a new reference feature amount into the memory when it is determined in said determining step that the recognition rate between

the feature amount extracted from the input face image and the reference feature amount previously registered in the memory is lower than a preset value,

determining a recognition rate between the feature amount extracted from the input face image and a new reference feature amount additionally registered in the memory when the new reference feature amount is additionally registered in the memory,

determining the recognition rate between the feature amount extracted from the input face image and the reference feature amount previously registered in the memory when it is determined in said determining step that the recognition rate between the feature amount extracted from the input face image and the new reference feature amount additionally registered in the memory is lower than a preset value, and

deleting the new reference feature amount which is already additionally registered in the memory and additionally registering the feature amount extracted from the input face image as a new reference feature amount into the memory when it is determined in said determining step that the recognition rate between the feature amount extracted from the input face image and the new reference feature amount additionally registered in the memory is lower than a preset value and the recognition rate between the feature amount extracted from the input face image and the reference

feature amount previously registered in the memory is lower than a preset value.